

Appl. No. 10/084,526
Amdt. Dated Mar. 2, 2004
Reply to Office action of November 17, 2003

Remarks

Specification

Applicant has amended the abstract to overcome the objection.

Claim Objections

Applicant has amended claim 12 to overcome the objection.

Allowable Subject Matter

Applicant has amended claim 9 to correct the irregularity in the claim's dependency. Applicant has also amended claim 10's dependency to more correctly specify the subject matter claimed. Both amendments accord with the specification as originally filed: see paragraph [0024], lines 7-9 thereof. It is submitted that these amendments do not change the patentability of claims 9 and 10, as detailed by Examiner on pp. 9-10 of the Office action. Accordingly, claims 9 and 10 should remain allowable.

Applicant has amended the dependencies of claims 13-16 to more correctly specify the subject matter claimed. These amendments accord with the specification as originally filed: see paragraph [0024], lines 7-10 thereof. Applicant has also amended the dependencies of claims 17-18 to more correctly specify the subject matter claimed. Both amendments accord with the specification as originally filed: see paragraph [0019].

Claim Rejections Under 35 U.S.C. 103

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Examiner has rejected claims 11-17 and 19-20 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,540,412 to Yonemura in view of U.S. Patent No. 5,111,476 to Yingst, and has also rejected claim 18 under 35 U.S.C. 103(a) as being unpatentable over Yonemura in view of Yingst in further view of U.S. Patent No. 6,558,191 to Bright. However, it is submitted that one of ordinary skill in the art could not derive the module of the present invention in light of Yonemura and Yingst.

Independent claim 11 recites a small form factor pluggable optoelectronic transceiver module for receiving and transmitting optical signals, the module comprising an optoelectronic transmitting device for converting the optical signals into electrical signals and transmitting the electrical signals onto an electrical interface of the module, an optoelectronic receiving device for receiving electrically encoded data signals and converting them into optical signals, a printed circuit board having a transmitting circuit and a receiving circuit thereon, the transmitting circuit electrically connecting with the optoelectronic transmitting device and the receiving circuit electrically connecting with the optoelectronic receiving device, a housing encasing the printed circuit board, and at least one shielding shell fixed on the printed circuit board and shielding at least one of the receiving circuit and transmitting circuit.

Examiner states that Yonemura does not disclose at least one shielding shell fixed to the printed circuit board and shielding at least one of the receiving circuit and transmitting circuit (page 5, lines 12-14 of the Office action). Examiner further states that it would have been obvious to one having ordinary skill in the art at the time the invention was made to [have] utilize the metallic shielding box fixed on top of the printed circuit board of Yingst for the optical module of Yonemura in order to provide an electronic package wherein optical and electronic parts are fitted together in a package providing shielding, grounding, thermal

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management, and mechanical protection of such parts (page 7, lines 1-6 of the Office action).

Applicant traverses Examiner's reasoning as follows:

Firstly, Yonemura discloses an optical transceiver 1 including a transmitter optical sub-module 2, a receiver optical sub-module 4 and a housing 6. The transmitter optical sub-module 2 has a transmitter optical sub assembly 25 and a transmitter circuit substrate 27. The receiver optical sub-module 4 has a receiver optical sub assembly 45 and a receiver circuit substrate 47. Yingst discloses a sub-assembly 69, which includes a platform 94, a spacer 110, an integrated circuit board 112, a pair of ports 70 and 71 and metallic shielding boxes 126 and 130. The boxes 126 and 130 cover circuit areas 114 and 116 (FIG. 4). Because Yonemura's transmitter circuit and receiver circuit are respectively defined on the transmitter circuit substrate 27 and receiver circuit substrate 47, Yonemura not only fails to disclose the feature of **"at least one shielding shell fixed on the printed circuit board and shielding at least one of the receiving circuit and transmitting circuit,"** but also fails to disclose the features of **"a printed circuit board having a transmitting circuit and a receiving circuit thereon"** of the present invention. Therefore, the present invention cannot be directly derived from Yonemura in view of Yingst.

Secondly, the Yonemura and Yingst references are impossible to combine. The transmitter circuit substrate 27 and receiver circuit substrate 47 of Yonemura are respectively arranged beside two sides of the partition wall 64, and a plurality of holes of the transmitter circuit substrate 27 and receiver circuit substrate 47 must cooperate with a plurality of pins 44 arranged at two sides of the partition wall 64. This structure locates the transmitter circuit substrate 27 and receiver circuit substrate 47 very close to the partition wall 64 (just like the third embodiment of

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Yonemura, FIG. 18). There is not enough space to utilize even one of the metallic shielding boxes 126 and 130 of Yingst. Therefore, the metallic shielding boxes 126 and 130 of Yingst are impossible to combine with Yonemura.

Thirdly, there is no motivation to utilize the metallic shielding boxes of Yingst for the optical transceiver of Yonemura. The metallic shielding boxes 126 and 130 of Yingst are mainly used to shield the different circuit areas 114 and 116 defined on a same circuit board to avoid electromagnetic interference between the circuit areas 114 and 116. Compare this with Yonemura's transmitter circuit and receiver circuit, which are respectively defined on the transmitter circuit substrate 27 and receiver circuit substrate 47, with a partition wall 64 arranged between the transmitter circuit substrate 27 and receiver circuit substrate 47. A metal shield 65 composed of a thin metal plate is attached and fixed along one side of the partition wall 64 (col. 10, lines 3-14 and FIG. 2). The metal shield 65 of Yonemura is used to shield and avoid electromagnetic interference between the transmitter circuit and receiver circuit which are respectively defined on the transmitter circuit substrate 27 and receiver circuit substrate 47. The metal shield 65 of Yonemura has the same function as the metallic shielding boxes 126 and 130 of Yingst. Therefore, there is no motivation to utilize the metallic shielding boxes 126 and 130 of Yingst for the optical transceiver 1 of Yonemura.

From another viewpoint, in Yingst et al. the outer shell (28) is made of plastic (column 3, lines 26-28) without any EMI (Electro-Magnetic Interference) protection, and this is the reason why it requires two sets of metal box (126, 130) encasing the corresponding active device components (114, 116) on the printed circuit board (112) (column 5, lines 29-30) for EMI shielding. Generally speaking, it will not naturally lead the skilled person to install additional metal shielding shell over the active device on the printed circuit board if there is already a huge metal housing shielding/covering the whole printed circuit board as shown

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in Yonemura et al.. It is an unobvious matter. The reason why the instant invention intentionally installs the seemingly redundant metal shielding shell is to (I) reinforce the EMI shielding and (II) prevent ESD (Electro-Static Discharge) thereabouts. This is also the reason why the inner metal shielding shell can be made from (thin) sheet metal with ventilation holes therein, in comparison with the outer thick/heavy duty housing without any ventilation apertures therein. None of the references purposely disclose or suggest this feature.

Accordingly, the small form factor pluggable optoelectronic transceiver module of the present invention cannot be obviously derived from Yonemura in view of Yingst. Therefore, claim 11 should be in a condition for allowance.

Claim 18 depends from claim 11; therefore claim 18 should likewise be patentable.

Independent claim 19 recites an optoelectronic module comprising a receptacle with a printed circuit board on a rear side thereof, a transceiver located in the receptacle and connected to the printed circuit board, a shielding shell encasing transmitting/receiving circuits formed on the printed circuit board and adjacent to the receptacle, a chassis located behind the receptacle and with means for fastening to the printed circuit board, top and bottom metal housings enclosing all the receptacle, the chassis and the printed circuit board, and means for fastening the housings and the chassis together. Examiner states that the claimed module is unobvious in view of Yonemura and Yingst.

Applicant traverses Examiner's rejection as follows:

Firstly, the present invention cannot be directly derived from Yonemura in view of Yingst, as asserted above with respect to claim 11.

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Secondly, the Yonemura and Yingst references are impossible to combine, as asserted above with respect to claim 11.

Thirdly, there is no motivation to utilize the metallic shielding boxes of Yingst for the optical transceiver of Yonemura, as asserted above with respect to claim 11.

Accordingly, the optoelectronic module defined by claim 19 is unobvious over the cited references. Therefore, claim 19 should be in a condition for allowance.

Claims 12-17 and 20 directly depend from independent claims 11 and 19 respectively. Therefore, claims 12-17 and 20 should likewise be patentable.

Claim Rejections Under Double Patenting

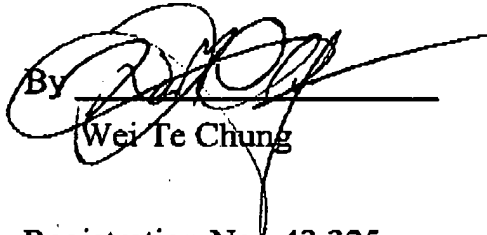
Claims 11-20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 2 of U.S. Patent No. 6,483,711 to Huang in view of U.S. Patent No. 5,111,476 to Yingst.

Similar to the third reason as above, Huang specifically claims the metal chassis and the metal housing, so it is also unobvious to apply the metal box (126, 130) of Yingst et al. unto the transmitting circuits or receiving circuits on the printed circuit board of Huang. Accordingly, removal of the obviousness-type double patenting rejection, is respectfully requested.

In view of the above claim amendments and remarks and the Terminal Disclaimer, the subject application is believed to be in a condition for allowance, and an action to such effect is earnestly solicited.

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